

Ideally, randomized controlled trials comparing endovascular ablation with open reconstruction are required to make firm recommendations for protocols of therapy. Given the paucity of visceral artery aneurysms, however, the distinct behavior between aneurysms of different visceral vessels and the malignant natural history of pseudoaneurysms, such studies would likely be not be realistic or fulfilling. Longer-term follow-up with larger patient cohorts are necessary to elucidate the ultimate role of endoluminal therapy in the treatment of visceral artery aneurysms and pseudoaneurysms.

## AUTHOR CONTRIBUTIONS

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## DISCUSSION

**Dr Paul Van Bemmelen** (Philadelphia, Pa). Did you rule out mycotic aneurysms in this population? Were there any comparable open treatments done during this time period, or is everybody treated endovascularly?

**Dr Nirman Tulsyan.** During the study period, we identified 90 patients with visceral artery aneurysms. Nineteen patients underwent open treatment. The choice of therapeutic modality was primarily operator-dependent given the retrospective nature of this paper. Of the patients who presented with true aneurysms, none clinically manifested prodromal symptoms or signs to suggest presence of a mycotic aneurysm or microbial arteritis with aneurysmal degeneration.

With respect to the pseudoaneurysms, the majority of patients presented with signs of systemic inflammation, whether that be intra-abdominal sepsis or retroperitoneal inflammation. While it is possible that these lesions were mycotic, we did not make the distinction nor did it change our management.

**Dr Grayson Wheatley** (Phoenix, Ariz). How do you approach visceral artery aneurysms with respect to embolization versus excluding with an endoluminal graft? I would think that some of these visceral aneurysms would be amenable to exclusion rather than embolization.

**Dr Tulsyan.** Subsequent to the end of the study period, we've actually treated multiple patients with stent grafts in an effort to maintain parent artery patency. With regard to true aneurysms, we have noted that use of stent grafts is a function of the location of the aneurysm. In the setting of a splenic artery aneurysm, for example, distal, hilar, or intrasplenic lesions would be technically difficult to treat with currently available stent grafts.

Additionally, we have noted a significant amount of elongation and tortuosity of parent arteries that occurs in the setting of visceral artery aneurysms. In attempting to treat a distal vessel it may be difficult to deliver your device. It may be feasible, however, in the setting of more proximal lesions.

**Dr. Robert Cambria** (Bangor, Me). Several small series have indicated association of stenosis of major visceral vessels with pseudoaneurysms or, rather, true aneurysms of the visceral segments. Did you notice this association and did it impact in any way on your approach? And finally, were there any aneurysms that you attempted to treat but could not?

**Dr Tulsyan.** In reviewing all of the imaging, we actually did not find a high incidence of aortoiliac occlusive disease. As such, this did not alter our treatment.

There was one technical failure in our series. This occurred in a patient who underwent successful treatment of a celiac axis aneurysm but had persistent flow within the celiac trunk after embolization. On follow-up imaging, there was a decrease in aneurysm size. However, since there was significant flow on completion angiography, a secondary intervention was performed via the SMA.

**Dr Kenneth Cherry** (Charlottesville, Va). When you have an aneurysm that involves either the SMA or one of its major branches, are you at all hesitant about providing an occlusive solution as opposed to one that insures continued patency?

**Dr Tulsyan.** All the patients in our study with mesenteric aneurysms were treated for lesions of branch vessels. We would be very hesitant to ablate a main trunk aneurysm of the SMA, for example, since the risk and sequelae of end-organ ischemia is significant in this situation. We would elect for alternative therapy in this instance.